

ABSTRACT

Methods of controlling a camless engine to prevent interference between engine valves and engine valves and pistons. The methods utilize one or more safe trajectories for the valves versus engine crankshaft angle. In normal operation, an engine valve control system monitors crankshaft angle and controls the engine valve so as to stay on the safe side of a safe trajectory. In the event the actual valve motion deviates excessively from the intended trajectory so as to reach or cross the safe trajectory, preventive action is taken, typically to command the engine valve to close. Safe trajectories may be stored in lookup tables, in equation form or both. In some cases a single safe trajectory for a valve may be sufficient, though in other cases, safe trajectories as a function of some engine operating conditions and environmental conditions, and in some cases may include crankshaft acceleration. Various embodiments are disclosed.